Conducting a pilot study: case study of a novice researcher

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Abstract

Pilot studies play a vital role in health research, but are often misused, mistreated and misrepresented. A well-conducted pilot study with clear aims and objectives within a formal framework ensures methodological rigour, can lead to higher-quality research and scientifically valid work that is publishable and can benefit patients and health service delivery. A pilot study contributes valuable information to assist researchers in the conduct of their study. Conducting a pilot study provides the researcher with the opportunity to develop and enhance the skills necessary before commencing the larger study. By conducting a pilot the researcher obtains preliminary data, can evaluate their data-analysis method and clarify the financial and human resources required. This article presents an overview of pilot studies, why they are conducted, what to consider when reporting pilot studies and the authors' experience of conducting a pilot study. To conduct a successful study, researchers need to develop their skills, choose the right methods and carefully plan for all aspects of the process.

Key words: Pilot projects, Research design, Nursing research

Introduction

A pilot study is a small-scale version of a planned study conducted with a small group of participants similar to those to be recruited later in the larger scale study. Pilot studies are conducted to allow researchers to practice and to assess the effectiveness of their planned data collection and analysis techniques. They can detect anticipated problems with methods so changes can be made before the large-scale study is undertaken and answer methodological question(s), guide the development of the research plan to ensure the methods work in practice and assess the feasibility of the proposed research process (Hundley and van Teijlingen, 2002; Kim, 2011; Leon et al, 2011). The terms pilot study and feasibility study are often used interchangeably (Arain et al, 2010; LaGasse, 2013).

However, there are differences between undertaking a pilot study and a feasibility study. Thabane et al (2010: 1) indicates that the aim of a pilot study is to evaluate the sustainability of a planned study and avoid problems that could arise when the large-scale study is conducted. Others see a pilot study as the conduct of a small version of a larger/main study to determine if all the components of the study will work together (Arnold et al, 2009; Arain et al, 2010; Leon et al, 2011, National Institute for Health Research, 2012). On the other hand, a feasibility study is undertaken to determine if the design, instrumentation and analysis are practicable and is important in the development of the main study to highlight aspects such as participant preparedness to be recruited, randomised, and their receptiveness to follow-up measures (Abbott, 2014).

Others see a feasibility study as an initial study to determine the practicability of study components and to identify important parameters that are needed to design the main study (National Institute for Health Research, 2012; Morin, 2013). When this information has been determined, the main study is designed, and the assessment of how well the study components work is through means of a pilot study (Tickle-Degnen 2013). A feasibility study

differs from a pilot study in that a feasibility study tries out pieces of the study, whereas the pilot study tries out the operation of all pieces as they will be implemented in the planned study (National Institute for Health Research, 2012).

This article seeks to identify why it is important to conduct a pilot study, presents a reflection on a pilot study by a novice researcher undertaking a qualitative study as part of their Master of Science degree, and addresses aspects to be considered when reporting a pilot study. Although many researchers do not consider publishing the results of a pilot study, Thabane et al (2010: 6) argued that: 'Researchers have an ethical and scientific obligation to attempt publishing the results of every research endeavour.' Moreover, making the results of a pilot study widely available can influence research resources and prevent needless repetition of effort (Connelly, 2008; Conn et al, 2010; Wolfe, 2013). In addition, Arain et al (2010: 6) advocated that: 'Publishing the results of a well conducted pilot study is important for research, irrespective of outcome.'

However, despite the usefulness of pilot studies, the literature discussing pilot work in qualitative research is limited (Caine et al, 2009; Kim, 2011). This may be owing to the fact that a pilot study produces viability outcomes rather than health outcomes. In addition, the editorial comment by Watson et al (2007: 619) that pilot studies are not usually suitable for publication has led to underreporting of pilot work as had been illustrated by van Teijlingen and Hundley (2002). However, where pilot studies are published, they present preliminary work in the development of a larger study and use sample sizes that are far beyond what is expected of the early-stage researcher or those conducting a small scale-study as part of their educational development. Thereby a lack of guidance and support exists to guide the early-stage researcher and those conducting further educational programmes around pilot studies (O'Cathain et al, 2015).

Why conduct a pilot study?

Pilot studies are useful for a number of reasons to researchers as they assess and prepare their data-collection and analysis techniques. In addition a pilot can be used to self-assess readiness, ability, and commitment as a researcher (Lancaster et al, 2004; Beebe, 2007). In this sense, a pilot study can be used to support researchers (Kilanowski, 2006) and enhance the credibility of a study (Padgett, 2008). Moreover, the use of a pilot study may allow the researcher to uncover ethical and practical issues that may hamper the main project (Sampson, 2004; Kelly, 2007). It is through the pilot study that the researcher can focus on, expand, or narrow the proposed research topic and gain a clearer understanding of the focus of the research (Williams et al, 2008; Denzin and Lincoln, 2013). The underlying question for the pilot study is whether a larger study is practical (Jeray and Tanner, 2012). This is addressed by the researcher answering fundamental questions before embarking on a full-scale study, so as to avoid unforeseen complications. This allows the researcher to decide whether changes are required to the research design, intervention or procedural protocols before conducting a larger study, through obtaining preliminary data, evaluating data analysis methods, clarifying financial, equipment, and personnel resources needed (Hundley and van Teijlingen, 2002; Conn et al, 2010; Leon et al, 2011).

While it is normally not the goal of a pilot study to provide conclusive results, it can give advance warning about where the main research project could fail, where research protocols may not be followed, or whether proposed methods or instruments are unsuitable, too expensive or too complex (Conn et al, 2010; Leon et al, 2011; Wolfe, 2013). Pilot studies can be based on quantitative or qualitative methods and large-scale studies may engage in several

pilot studies before the main study is started, and these are often used in convincing funding bodies that the research proposal is worthy of funding (van Teijlingen and Hundley, 2002). While completing a successful pilot study does not assure success of the full-scale study, as problems may not become clear until the larger-scale study is conducted, a pilot study is a crucial element of a good study design (Morin, 2013). The primary benefit of conducting a pilot study is that it provides the researcher with a chance to make adjustments and revisions to the main study (Kim, 2010). The researcher can test: a research protocol, i.e. data-collection method (e.g. survey or qualitative interview guide), assess the viability of the sample-recruitment strategy and the viability of the proposed research process, including its cultural and local political context (Hundley and van Teijlingen, 2002).

The importance of a pilot study within quantitative studies as a means for testing methods and study procedures (Pritchard and Whiting, 2012) is ingrained within research practice. This can be to test study procedures, sampling procedures and questionnaire design, to determine feasibility and acceptability of intervention, to assess controlled condition protocols, and evaluate initial data in an emerging area of research (Lancaster et al, 2004; Leon et al, 2011; Shanyinde et al, 2011). This provides the researcher with essential information before a more lengthy and costly study is attempted (Leon et al, 2011).
Despite the significance and usefulness of pilot studies, the availability of literature discussing pilot work in qualitative studies is limited (Beebe, 2007; Padgett, 2008) and its relevance and appropriateness has been somewhat disputed. Holloway (2008) suggested that in qualitative research, pilot studies are not essential because the research has the flexibility for the researcher to learn on the job. When qualitative researchers highlight the significance of pilot studies they often do so to comment on specific aspects of research design, with interview protocols most frequently cited (Silverman, 2013).

Interviews appear to gain more attention as they are a generic data-collection method, and the significance of ensuring the interaction with participants is both effective and ethical (Cassell, 2005; Pritchard and Whiting, 2012). However, it is recommended to further extend the scope of pilot studies beyond data collection to examine negotiating of entry and orientation to the research site, and the transcription and analysis processes (Guest and MacQueen, 2008; Pritchard and Whiting, 2012). This would allow for exploration, reflexivity, creativity, mutual exchange and interaction through examining the establishment of research relationships (Caine et al, 2009). Sampson (2004) highlighted the significance of preliminary fieldwork in considering broader and important issues such as research validity, ethics, representation and researcher health and safety. This suggests a qualitative pilot study provides the researcher with introductions to unknown worlds through the researcher engaging in reflexivity (Caine et al, 2009; Pritchard, 2011; Pritchard and Whiting, 2012).

Reporting a pilot study
When reporting a pilot study, in addition to typical research components, researchers should consider a number of issues. The abstract should report the preliminary nature and emphasise viability issues (Algase, 2009) and include a reason for undertaking the pilot study (Thabane et al, 2010). In quantitative studies, researchers should indicate how feasibility will be assessed and evaluated, consider issues of recruitment and identify feasibility objectives in addition to study aims and objectives (Thabane et al 2010; Leon et al 2011). In qualitative studies, researchers should indicate how the effectiveness of the data-collection and analysis techniques were evaluated. Researchers should interpret results within the context of viability and when necessary include the measures that need to be taken to make the study viable (Arain et al, 2010; Thabane et al, 2010). When reporting a pilot study, the researcher should

provide a section addressing lessons learned and how these enable the development of a more cohesive study with greater potential to contribute to nursing knowledge. Conducting a pilot study prior to a larger-scale study should highlight issues that could affect the outcome of the larger-study and enable the researcher to address these issues. Addressing these issues may enhance the possibility of generating nursing research that can contribute to nursing knowledge.

Experience of a pilot study

The pilot experience described in this article is based on the researcher's (CD) study to explore the experience of learning disability nurses (known as intellectual disability nurses in Ireland) caring for older people with a learning disability. The researcher conducted a pilot study with one participant, to explore the viability of the interview schedule, the researcher's interview technique, transcription skills and data-analysis skills. The implementation of the pilot study proved essential in a number of ways. First, finding issues and barriers related to recruiting potential participants. Second, engaging oneself from a phenomenological perspective, where the researcher creates meaning from the participants' experiences in an attempt to understand their perceptions, perspectives and understandings of a particular situation/phenomenon; through engaging with participants and a shared meaning, the researcher can express the experience from the participants' perspective. Third, reflecting the importance of the research process and the difficulty in conducting phenomenological inquiry. Finally, reflecting on the interview and interview questions.

On receipt of ethical approval from the service organisation research ethics committee, access to the research site was gained through the director of nursing of a learning disability service. In applying for access, a gatekeeper was also requested to distribute the study materials to the nurses who met the inclusion criteria. This ensured the researcher did not have any personal details of the nurses before their decision to participate. The gatekeeper distributed the study packs, which included a letter of invitation, an information sheet, an expression-of-interest form and a stamped addressed envelope. On receipt of the expression of interest form (which comprised personal contact details and preferred times of contact) the researcher contacted the potential participant to explain the study and answer any questions. The potential participant was then given 7 days to further consider the information about the study before the researcher made contact again to arrange the interview and answer any further questions. On the day preceding the agreed date of interview, the researcher contacted the participant to confirm the interview time, venue and date and gave her the opportunity to ask any questions and reiterate the process involved. This process gave the participant ample time to consider her involvement and provided her with an explanation of the process throughout, with the opportunity to seek clarification of any concerns that arose. As the inclusion criteria were specific to the experience being investigated and there was little research in the area, there was a good response and interest in participating. The prior process of engaging with the participant in arranging the pilot interview enabled the participant to come to the interview in a relaxed manner, and through engaging with the participant during the interview it was evident they became relaxed answering interview questions. Engaging in the process of arranging and conducting the interview the researcher was confident that a good response and engagement of participants would be possible in the large study and that this would fulfil the needs of the study with regards to sample size to reach data saturation. In addition it was anticipated that this engagement would prevent drop out after participants had expressed their interest to be involved which was a concern for the main study.

The researcher had chosen a Heideggerian phenomenological approach, using semi-structured interviews and Burnard's (2006) thematic content analysis framework to guide the study. A Heideggerian phenomenological approach was chosen as it was in accordance with the study aim and considered appropriate in examining the qualities of human experience (Balls, 2009). This is when the researcher brings their own experience and understanding into the research process, as Heidegger believed that it was not possible to separate the researcher's beliefs from the study (Reiners, 2012). As a registered learning disability nurse working in practice with an ageing population, the researcher had exposure to the phenomenon under investigation. This experience placed the researcher as an insider and in a position of sharing the experience, therefore adopting a shared meaning was deemed appropriate and necessary to interpret the experience of registered nurses caring for older people with a learning disability. Within the phenomenological approach, the participant is acknowledged as the expert of the phenomenon under investigation, and while the researcher may know the literature and theories, they do not know the relevant dimensions of the experience being reported by the participant (Giorgi, 2006). Adopting a shared meaning allows the researcher access the participant's life/world to gain a deeper understanding. In addition, as little research exists on the experiences of registered learning disability nurses caring for the older person, the researcher adopted a phenomenological approach to gain both an understanding and interpretation of the experience.

In preparing the pilot, the researcher's concerns were based on data-collection method appropriate for phenomenological inquiry. As the focus is on interpreting experiences, it was important to let the participants' voice be heard through in-depth interviewing. Before the main study being undertaken, the decision to implement a pilot was made with the aim of testing the feasibility of the proposed study. In addition, as a novice researcher there was an opportunity to gain the necessary experience of conducting the interview, using the interview guide, identifying any practical issues or difficulties in transcription, data-analysis and phenomenological interpretation. The methods of data collection used in this pilot were an in-depth semi-structured interview, field notes and a journal log, which permitted reflection on the pilot experience. The interview was conducted at a venue of the participant's choice, audio-recorded and lasted 52 minutes. The participant actively participated in the interview, signed the consent form and granted permission to be audio recorded. Engagement as a researcher in a culturally appropriate way and from a phenomenological perspective while conducting interviews and analysing data was difficult. To do this it was important for the researcher to remain critically self-aware (Finlay, 2008). In order to conduct an in-depth interview, it was necessary to adapt the interviewing style and consistently and consciously be aware of the role as a researcher from a phenomenological perspective rather than as a colleague having a broad discussion.

As the main tool in data collection, the researcher became aware of how to ask questions that reflected the participant's area of interest rather than from the researcher's own area of interest. The researcher realised their focus needed to be on what the participant had said and not simply the questions that were in the interview guide. As a phenomenological researcher, the focus was on capturing the whole experience and allowing the interview to reflect the nature and essence of the participant's experiences. Based on experiences from the pilot interview, the interview questions for the main study were only modified in terms of phrasing so that they would be broad enough for participants to narrate their own experiences. The process of listening, re-listening to the recording, transcribing the interview verbatim and reviewing it as an individual and with the researcher's supervisor was key to deciding on the appropriateness of the interview guide, the researcher interview technique and the decision to

proceed. Through the exposure of conducting data analysis on the pilot transcript, the researcher became aware of the diversity in the construction and meaning of certain concepts, even when the researcher and participant shared the same background. A crucial aspect of the pilot was the realisation of the underestimation of the time required to conduct the transcription of the audio recording and the time required to go through the data-analysis process to formulate higher order categories from the initial highlighted key statements.

However, this awareness prepared the researcher for the process to come and the time required. Qualitative data collection and analysis are often progressive, with interviews developing and improving as the researcher gains insight that enables them to improve interview schedules and specific questions. Listening to the recording and reading through the transcript helped the researcher to improve the questions and the way of introducing the issues into the interview and moving between topics.

Conclusion

Pilot studies are small-scale versions or trial runs of a planned study, their purpose includes assessment of implementation issues related to research design and methods such as recruitment strategies, sample availability, adequacy of instruments, and data-collection and analysis plans. Pilot studies may be used to gain experience, develop the researcher and to understand the related possible risks and study costs. These studies help researchers decide if they should pursue larger-scale studies and if so, areas for development to ensure a feasible full-scale study (van Teijlingen et al, 2001). Within a pilot study, a trial run of a project with a small group of participants who are similar to those to be recruited in the larger-scale study is conducted to allow the researcher to rehearse and assess the usefulness of the proposed data collection and analysis techniques. Thereby, problems with the methods can be identified and changed before the largescale study commences (Yin, 2011). Some small-scale exploratory studies are often called pilot studies even though a larger study is not specifically planned at the time when they are undertaken. Well-designed and well-conducted pilot studies can inform researchers about the best research process and possible outcomes and is an important step in research that should not be overlooked (LaGasse, 2013). Researchers should report more findings from pilot studies and in particular, report in more detail the improvements made to the study design and the research process (van Teijlingen et al, 2001).

Key points

- A pilot study is an essential part in the development of the researcher's understanding and use of the study design and methods.
- Conducting a pilot study allows the researcher decide if any changes are necessary and ensure an effective plan is in place.
- Pilot studies should be considered for publication and when reporting researchers should outline the lessons learned, the development made for a more cohesive study and how a larger study will contribute to nursing knowledge

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